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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,720	04/13/2006	Per Sjodin	09546-027US1	3242

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EXAMINER	
COX, ALEXIS K	
ART UNIT	PAPER NUMBER
3744	

NOTIFICATION DATE	DELIVERY MODE
10/13/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No.	Applicant(s)	
	10/575,720	SJODIN ET AL.	
	Examiner	Art Unit	
	ALEXIS K. COX	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *31,34-49 and 52-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *31, 34-39, and 52-62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 31, 34, 37-41, 44-47, 49, 52-55 and 68-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,722).

Regarding claims 31, 34, 37-41, and 44-47, Fuerschbach et al teach a plate heat exchanger (10, see column 4 lines 25-26) comprising a number of heat exchanger plates (see column 2 lines 8-11), which are arranged beside each other and connected to each other by means of a braze connection (see column 5, lines 15-16) accomplished by means of a braze process (see column 6 lines 59-64; claim 34), wherein the heat exchanger plates are substantially manufactured in stainless steel containing chromium (see column 6 lines 18-20), wherein the plate heat exchanger includes a number of port channels extending through at least some of the heat exchanger plates (40, 41, 40a, 41a, see column 5 lines 49-54) including an outer heat exchanger plate, wherein one or more of the port channels are surrounded by a connection surface (22, see column 5 lines 49-50), which is the portion of the braze alloy sheet which connects the port channels to the pipe member by surrounding the port channel via the connection member, and is for connection of the one or more port channels to a pipe member (see column 5 lines 66-67), as pipes are what pipe nipples connect to. Fuerschbach further teach the connection member to be designed as a pipe nipple (IH, OH, see column 5 lines 66-67), with the connection surface being that portion of the pipe nipple which changes composition by brazing with the braze alloy sheet. It is noted that Fuerschbach et al do not explicitly teach the connection surface to include a material to permit brazing of the pipe member to the connection surface in a

more easy manner than to stainless steel, the material being more reduction susceptible than chromium dioxide, or for that material to be based on nickel. However, the method of Usui teaches the use of a connection surface between stainless steel and stainless steel or another metal (see column 2 lines 49-53). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the system of Fuerschbach et al using the brazing technique of Usui, as the brazing of Usui results in a stronger bond than traditional brazing methods. Mizuhara teaches 5-35% palladium, 20-84% copper, and 10-50% nickel as a brazing alloy (column 1, lines 59-65). The available percentages of materials taught by Mizuhara include brazing alloys based on nickel. Therefore, the substitution of the brazing alloy of Mizuhara would have been obvious to one of ordinary skill in the art at the time of the invention, as the brazing alloy of Mizuhara is structurally equivalent to that of Usui, and a simple substitution does not render a structure patentably distinct over an existing structure. Further, regarding claims 31 and 34-36, the examiner recognizes that these claims are deemed "product-by-process" type claims. In product-by-process claims, "once a product appearing to be substantially identical is found and a 35 U.S.C. 102/103 rejection [is] made, the burden shifts to the applicant to show an unobvious difference." MPEP 2113. This rejection under 35 U.S.C. 102/103 is proper because the "patentability of a product does not depend on its method of production." In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claims 49, 52-55 and 58-60, the structural requirements of the method of these claims is filled by the system of Fuerschbach et al when manufactured with the

method of Usui and the material substitution of Mizuhara, as shown above. Further, the step of brazing may take place at vacuum-like pressure (see column 6 lines 60-61 of Fuerschbach) or in an atmosphere with substantially inert air gas (see column 2 lines 13-15 of Fuerschbach). Additionally, the method of Fuerschbach et al as modified by the method of Usui requires applying the connection member to the outer surface area at each port channel before the joining of heat exchanger plates (see column 6 lines 56-64) and applying the material for forming the connection surface during the braze process.

Regarding claims 61 and 62, the structural requirements of the method steps of these claims is filled by the system of Fuerschbach et al when manufactured with the method of Usui and the material substitution of Mizuhara, as shown above. . Further, the step of brazing may take place at vacuum-like pressure (see column 6 lines 60-61 of Fuerschbach) or in an atmosphere with substantially inert air gas (see column 2 lines 13-15 of Fuerschbach). Additionally, the method of Fuerschbach et al as modified by the method of Usui requires applying the connection member to the outer surface area at each port channel before the joining of heat exchanger plates (see column 6 lines 56-64 of Usui), and for pressing the plates to be brazed together to be part of the conventional brazing process (see column 1 lines 9-13 of Usui), and the arrangement of the parts being brazed to be "by a conventional method" (see column 3 lines 5-7 of Usui), thereby disclosing pressing the plates together. As the purpose of Usui is to be a method of brazing stainless steels, and Fuerschbach discloses a brazed heat exchanger, the use of the method of Usui for the manufacture of the product of

Fuerschbach would have been obvious to one of ordinary skill in the art at the time of the invention.

5. Claims 35, 36, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,722), and further in view of Wells (US Patent No. 3,675,311).

Regarding claims 35, 36 and 56, it is noted that the combination of Fuerschbach et al, Usui, and Mizuhara do not explicitly teach the material to be bound to the stainless steel by diffusion. However, the method Wells teaches the material of Fuerschbach et al in view of Usui and Mizuhara to be bound to the stainless steel by diffusion brazing (see column 1 lines 67-70). Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of Wells to modify the system of Fuerschbach et al in view of Usui and Mizuhara in order to perform diffusion brazing, which results in a stronger joint strength.

6. Claims 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,772), and further in view of the Encyclopedia Britannica 15th edition brazing article.

Regarding claims 42 and 43, the system of Fuerschbach in view of Usui teaches the material to have been applied onto the primary surface by means of and during a braze process, as shown above. It is noted that the system and method of Fuerschbach et al in view of Usui and Mizuhara do not teach the use of abrasive blasting or any

similar roughening process to facilitate the wetting of the primary surface with the material. However, it is well-known that "preparation of the surfaces by mechanical or chemical cleaning is important for brazing" (Encyclopedia Britannica, 15h edition, volume 2, page 489, brazing, lines 29-31 of the article; claim 42), and it would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use mechanical abrasive cleaning in place of a chemical bath in the system of Fuerschbach et al in view of Usui and Mizuhara. Further regarding claims 42 and 43, the examiner notes that the patentability of a product is not determined by means of production, but by the end product itself, and therefore the process is given little patentable weight provided all structural limitations are met.

7. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,772), and further in view of Blomgren (US Patent No. 6,016,865).

Regarding claim 48, it is noted that the system of Fuerschbach et al in view of Usui and Mizuhara do not explicitly teach the use of a washer for the connecting member. However, Blomgren teaches the use of a washer (15, see column 4, lines 7-9) as a connection member, and wherein the washer is brazed to the heat exchanger of Blomgren. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the washer of Blomgren in the system of Fuerschbach et al in view of Usui and Mizuhara as a connector in order to reduce material costs to the manufacturer of the heat exchanger, displacing them to the manufacturer of pipes and

surrounding equipment. Further regarding claim 48, the examiner notes that the patentability of a product is not determined by means of production, but by the end product itself, and therefore the process is given little patentable weight provided all structural limitations are met.

8. Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,772), and further in view of Wells (US Patent No. 3,675,311) and furthermore in view of the Encyclopedia Britannica 15th edition brazing article.

Regarding claim 57, it is noted that the method of Fuerschbach et al in view of Usui and Mizuhara do not explicitly teach the use of abrasive blasting or any similar roughening process to facilitate the wetting of the primary surface with the material. However, it is well-known that "preparation of the surfaces by mechanical or chemical cleaning is important for brazing" (Encyclopedia Britannica, 15h edition, volume 2, page 489, brazing, lines 29-31 of the article), and it would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use mechanical abrasive cleaning in place of a chemical bath in the system of Fuerschbach et al in view of Usui and Mizuhara and further in view of Wells.

Response to Arguments

9. Applicant's arguments filed 7/28/2009 have been fully considered but they are not persuasive.

The applicant argues on page 9 that Fuerschbach, Usui, and Mizuhara, alone or in combination, do not disclose or render obvious the claimed subject matter.

More specifically, the applicant argues on page 9 that Fuerschbach does not disclose plates substantially manufactured in stainless steel and containing chromium, a connection surface formed by a nickel-based material that is easier to braze than stainless steel, or the material to be more reduction susceptible than chromium dioxide.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the "interconnection techniques of Fuerschbach" are not exclusive with the brazing method of Usui; the techniques of Fuerschbach are for the arrangement of the heat exchanger. The actual brazing technique is not explicitly required; "other means of interconnecting the components such as welding also could be employed" (see column 6 line 68 and

column 7 line 1). This makes the substitution of the method of Usui for the brazing method an obvious variant upon Fuerschbach et al to one of ordinary skill in the art at the time of the invention.

The applicant argues on pages 10 and 11 that even if the use of Usui were obvious, it would not result in the structure claimed. The applicant asserts that it is "self-evident" that the materials are not structurally equivalent, because they are made of different metals; more exactly, because the copper base tin-alloy would not include nickel. However, the two materials have similar properties, and are used in the same way to get the same final result. This makes them structurally equivalent.

The following is a quotation from the MPEP, section 2141:

The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in KSR noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The Court quoting In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), stated that “[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.’” KSR, 550 U.S. at ___, 82 USPQ2d at 1396. *Exemplary rationales that may support a conclusion of obviousness include: (emphasis added)*

(A) Combining prior art elements according to known methods to yield predictable results;

(B) *Simple substitution of one known element for another to obtain predictable results; (emphasis added)*

(C) Use of known technique to improve similar devices (methods, or products) in the same way;

(D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

(E) " Obvious to try " – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

(F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;

(G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention. See MPEP § 214 3 for a discussion of the rationales listed above along with examples illustrating how the cited rationales may be used to support a finding of obviousness. See also MPEP § 2144 - § 2144.09 for additional guidance regarding support for obviousness determinations.

The applicant's attention is especially drawn to (B), which indicates that a simple substitution for predictable results is, in and of itself, a motivation. This can hardly be considered irrelevant to establishing obviousness. Should this be insufficient, the applicant is reminded of the market reality that various materials are worth different amounts of money at different times, and that it is common practice in manufacturing to

use the least expensive of the available materials when more than one is equivalent for the purpose of the item being manufactured.

Finally, the applicant argues that the heat exchanger of Fuerschbach, Usui, and Mizuhara would not have resulted in 1) plates substantially manufactured in stainless steel and containing chromium, 2) a connection surface formed by a nickel-based material easier to braze to than to stainless steel or 3) where the nickel-based material is more reduction susceptible than chromium dioxide.

It is an inherent property of the material that a surface which is nickel-based will be more reduction susceptible than chromium dioxide and easier to braze than stainless steel. Indeed, the applicant is reminded that the definition of stainless steel includes that it contains chromium (see attached definition). The degree to which nickel-based material is susceptible to reduction is readily available in any number of references on materials, as is that of chromium dioxide. As it has been shown above, the heat exchanger resulting from the method substitution of Usui and the material substitution of Mizuhara would have resulted in the proper structure; indeed, even the method claimed has been disclosed by the applied references. All arguments are, therefore, unpersuasive.

The applicant repeatedly argues, regarding numerous claims, that specific references do not relate to a stainless steel heat exchanger. This is, once again, arguing references separately, and therefore unpersuasive.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXIS K. COX whose telephone number is (571)270-5530. The examiner can normally be reached on Monday through Thursday 8:00a.m. to 5:30p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AKC/

/Frantz F. Jules/

Supervisory Patent Examiner, Art Unit 3744